REMARKS

Claims 15-34 are pending in the application. Applicants appreciate the Examiner's indication of allowable subject matter in claim 26.

Claims 15-22, 25, 27-30, 33 and 34 stand rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over U.S. Patent No. 6,661,752 (Spink et al.). Claims 23, 24, 31 and 32 stand rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Spink et al. in view of U.S. Patent No. 5,002,375 (Hoppl et al.). Applicants respectfully request withdrawal of these rejections and allowance of the pending claims.

Exemplary embodiments are directed to a microscopy system for observing an object by plural observers. As recited in claim 15 for example, the microscopy system comprises at least one objective lens arrangement for receiving an object side beam emanating from an object plane and for transforming the object side beam into an image side beam, a first ocular system arranged to enable a first observer to observe the object by looking into the first ocular system, a second ocular system arranged to enable a second observer to observe the object by looking into the second ocular system and a controller.

The first ocular system comprises at least one first ocular tube having at least one first ocular for generating an image of the object plane from the image side beam and at least one first image projector having a first display for superimposing an image displayed by the first display with a beam path of the first ocular system such that the image of the object plane is perceived by the first observer in superposition with the image of the first display.

The second ocular system comprises at least one second ocular tube, distinct from the at least one first ocular tube, and having at least one second ocular for generating an image of the

object plane from the image side beam, and at least one second image projector, distinct from the at least one first image projector, and having a second display, distinct from the first display, for superimposing an image displayed by the second display with a beam path of the second ocular system such that the image of the object plane is perceived by the second observer in superposition with the image of the second display.

At least one optical setting of the first ocular system is adjustable independently of a corresponding optical setting of the second ocular system. The controller is configured to generate the image displayed by the first display of the first ocular system from a first input image based on the at least one optical setting of the first ocular system as well as to generate the image displayed by the second display of the second ocular system from the first input image based on the at least one optical setting of the second ocular system.

Exemplary embodiments as illustrated in Figure 1 disclose a surgical microscope that allows two users to inspect an object through a single objective lens 3. Each user looks into his own binocular to obtain a stereoscopic view of the object. Each binocular is independently rotatable about an optical axis 9 and has its own zoom system 31, 37 to facilitate independent adjustment of the magnification.

Each binocular further comprises an image projector 55 to generate an image which is superimposed with the view of the object. The image generated by the image projectors is generated from two **different** input images 67, 69 which are handled in different ways.

The **first input image** 67 represents a structure that corresponds with the observed object. For example, the input image 67 may represent a structure determined by a computer tomographic method. The structure of input image 67 is to be displayed such that, when it is

superimposed with the image of the object, structure of the displayed image matches with structure of the object. If one of the users changes the optical setting of the zoom system, resulting in a scaling of the displayed object, the displayed structure scales accordingly. Furthermore, if one of the users changes the position of his binocular about the optical axis resulting in a rotation of the image of the observed object within the field of view of the user, the orientation of the displayed structure changes to preserve the matching of the displayed structure and the corresponding structure of the object.

Thus, the **first** input image displayed by the image projector of the first binocular is scaled **in dependence of** the magnification of the zoom system of the first binocular and rotated in dependence of the angular position of the first binocular about the optical axis. As recited in claim 15, the image displayed by the first display of the first ocular system is generated from the first input image **based on** at least one optical setting of the first ocular system. The optical setting comprises the magnification of the zoom system and the angular position about the optical axis. The generation of the image is **based on** the optical setting. The optical setting has an influence on **how** the image is generated. In particular, a gradual change of the optical setting also results in a gradual change of the generated image.

Similarly, the image displayed by the **second** display of the **second** ocular system is generated from the first input image based on the at least one optical setting of the **second** ocular system.

The optical settings of the first ocular system can be adjusted **independently** of the corresponding optical setting of the second ocular system.

The **second input image** 69 may comprise data represented as text or characters. This data may be displayed always in a same size, independent of the setting of the magnification of the respective binocular. Furthermore, this data may be displayed always in a same orientation with respect to the field of view of the respective binocular. For example, text data may be represented (or, displayed) in an upright orientation, independent of the rotational position of the binocular about the optical axis.

Thus, the first and second input images are handled differently: the **first** input image is displayed **in dependence on** the optical setting of the ocular system, whereas the **second** input image is displayed **independent of** the optical setting of the ocular system.

The Office Action states (at page 3, line 10) that the microscope of Spink is configured to generate the displayed image from a first input image based on the at least one optical setting of the first ocular system and a second image based on the optical setting of the second ocular system (relying on col. 9, lines 49 to 53 of Spink). This is an erroneous interpretation of Spink. There is no disclosure in Spink suggesting that the generation of the image displayed by display 16 is dependent on an optical setting of the microscope.

The cited portions of Spink (col. 9, lines 49 to 53) describe element 30 as "Shutter controller (for detecting the position or setting and/or for controlling the shutters)", element 31 as "Controller for data-type information with memory and user setup" and element 32 as "Control and sensors for the rotation prisms (for detecting the position or setting and/or for controlling the prisms".

It is not clear what the term "data-type information" refers to in this context. The words "data-type" appear in another portion of Spink (col. 4, lines 30 to 35) but do not provide

additional meaning or interpretation. Therefore, it is not clear how a person of ordinary skill in the art would interpret the term "controller for data-type information with memory and user setup". A person of ordinary skill in the art may attempt to comprehend the technical function of the disclosed microscope. The microscope disclosed by Spink can be operated in "three different **types** of observation or application" (col. 2, line 15 and as illustrated in Figures 5, 6 and 7).

Figure 5 illustrates a **first type** of observation where the assistant 40 stands opposite the surgeon 41 and both the surgeon and assistant use outputs 21a and 21b of the microscope stereoscopically.

A **second type** of observation is illustrated in Figure 6 where the surgeon 40 uses the outputs 21a and 21b stereoscopically whereas the assistant 40 uses only the right-hand observation output 20b (col. 2, line 37). In order to illustrate this further, U.S. Patent No. 6,765,718 ('718 patent) is being submitted concurrently in an information disclosure statement (IDS). The '718 patent corresponds to WO 01/27659 A2 (also being submitted) cited by Spink (at col. 1, lines 64-66) and incorporated by reference in Spink. Spink attempts to improve the microscope shown in the '718 patent

Figure 1 of the '718 patent illustrates an ocular system 15 for the surgeon which receives two stereoscopical observation beams from the objective lens. Figure 1 further illustrates an ocular system 19 for the assistant. This ocular system 19 is supplied with light from only one of two beam splitters 3 disposed in the stereoscopic beam path. The other beam splitter reflects a portion of the light to a camera 5.

Spink illustrates (Fig. 7) a **third type** of observation where the surgeon uses the observation outputs 21a and 21b stereoscopically whereas the assistant uses the left-hand

observation beam path 20a monoscopically.

For changing the type of observation of the microscope according to Spink, it is necessary to choose one of the setups illustrated (in Figures 5, 6 and 7). This includes removing the ocular system of the assistant from the right-hand observation beam path 20b as illustrated (in Figure 6) and mounting the ocular system of the assistant on the left-hand observation beam path 20a as illustrated (in Figure 7). It is not possible to gradually change the angular position of the ocular system of the assistant from right (Figure 6) to left (Figure 7).

The control and sensors of Spink relate to control and detection of the positions of shutters 17a, 17b and 18a, 18b and the control and detection of the position of prisms 14, 12a and 12b. The control of the shutters is generally decided by the surgeon (see col. 2, lines 32 to 36) depending on his or her preference as to whether the data displayed by display 16 should be visible in the right output 21b as illustrated (in Figures 1 and 2) or in the left output 21a as illustrated (in Figures 3 and 4). Control of the shutters may also be decided based on the further preference as to whether the data displayed by display 16 should be displayed in superposition with the image of the object as illustrated (in Figure 1) where shutter 17b is open or not as illustrated (in Figures 2, 3 and 4), where shutter 17b is closed (Figure 2) or shutter 17a is closed (Figures 3 and 4).

Prisms 12a and 12b are each in one of two different positions depending on the position of the assistant relative to the microscope as illustrated (in Figure 8).

Therefore, the person of ordinary skill in the art will interpret the words "data-type information" of Spink (col. 9, line 49) such that they relate to the positions of the shutters 17a, 17b, 18a and 18b and prism 14, 12a, 12b depending on the preferences of the surgeon and the

position of the assistant. Based on such understanding, the person of ordinary skill in the art would not assume that the generation of the image displayed by display 16 is dependent on any of the settings of shutters and prisms. Therefore, Spink does not render obvious exemplary embodiments as recited in claim 15 that the images displayed by the first and second displays are generated **based on** the corresponding optical settings of the first and second ocular systems, respectively.

The Office Action appears to analogize the positions of shutters 17a, 17b, 18a, 18b and position of beam splitter 14 with the "optical setting" of exemplary embodiments as recited in claim 15. Assuming, *arguendo*, that such analogy is valid, the position of the shutters and beam splitter has no influence on the generation of the image displayed by display 16. The controller 30, 31, 32 of Spink is **not** configured to generate the displayed image based on one of the optical settings of the microscope.

Spink discloses only one display as opposed to two displays as recited in claim 15. The Office Action asserts (at page 3, line 17) that it would have been obvious to one of ordinary skill in the art to duplicate the display element 16. However, mere duplication of the display fails to disclose exemplary embodiments as recited in claim 15: the image generated by the first display can be different from the image generated by the second display since the optical settings of the first and second ocular systems are **adjustable independently from one another** and the generation of the image displayed by the first display of the first ocular system from the first input image is based on the at least one optical setting of the first ocular system whereas the image displayed by the second display of the second ocular system is generated from the input image based on the at least one optical setting of the second ocular system.

Spink fails to disclose a dependency of the image generation from any optical setting nor does Spink suggest handling the generation of the images displayed by the first and second displays differently.

At least for these reasons, it is believed that claims 15 and 28 are allowable over the teachings of Spink.

The remaining claims, all of which depend on one of allowable claims 15 and 28, are also allowable. Claim 16, for example, recites that the image displayed by the first display of the first ocular system is further generated from a second image independently of the at least one optical setting of the first ocular system. That is, different processing of the first and second input images may take place. The first input image is processed in dependence on the optical setting of the first ocular system, whereas the second input image is processed independently of the at least one optical setting of the first ocular system.

Spink does not distinguish between first and second input images. Spink is silent on how the display is generated. Spink simply fails to suggest the different processing of the first and second input images wherein the first image is processed in dependence on the optical setting and the second image is not processed in dependence on the optical setting.

Spink similarly fails to disclose exemplary embodiments as recited in claim 17.

Claim 18 recites that the optical setting of the first ocular system is determined from a comparison of images detected by first and second cameras. Spink does not disclose two cameras 13a, 13b. Spink also fails to disclose that the optical setting, i.e. the shutter location, is determined based on the superimposition of the image.

The Office Action again refers to Spink (col. 9, lines 49 to 53). The deficiencies of this portion of Spink have been highlighted above. Therefore, Spink fails to teach or suggest exemplary embodiments as recited in claim 18.

Claim 19 recites that the first ocular tube of the first ocular system is rotatable about the optical axis. The Office Action assumes that this is also disclosed in Spink (referring to Figures 5 to 7). This is an erroneous interpretation of Spink. Spink illustrates (Figures 5, 6 and 7) that the ocular system of the surgeon 41 is always in a same relation relative to the microscope body 45. Spink does not disclose or suggest that the ocular system of the surgeon is rotatable about the optical axis of the objective lens of the microscope.

Furthermore, the ocular system of the assistant can be mounted according to three different configurations on the microscope body: either opposite to the surgeon, using both outputs 21a and 21b stereoscopically (Figure 5) or to the right of the surgeon (Figure 6) using only the right output 21b, or to the left of the surgeon, using only the left output 21a. Thus, it is not possible to rotate the ocular system of the assistant about the optical axis of the objective lens. It is only possible to mount the ocular system of the assistant in three different configurations. This is also consistent with Figure 1 of 27659.

Spink does not disclose different generation of the image depending on any optical property. Spink also does not disclose rotation of the ocular system about the optical axis. There is no motivation for the person of ordinary skill in the art to detect an angle between the objective lens and the ocular tube and therefore, claim 20 is not made obvious by Spink.

The deficiencies of Spink, as highlighted above, are not overcome by Hoppl.

All of the rejections having been overcome, it is believed that this application is in condition for allowance and a notice to that effect is solicited. Should the Examiner have any questions with respect to expediting the prosecution of this application, he is urged to contact the undersigned at the number listed below.

Respectfully submitted,

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